Non-Chemical Nematode Control Products

THERE are no effective, legal nematicides available for many situations, especially permanent landscape plantings. Pre-plant treatment with a fumigant such as Vapam® is laborious, must be done long before planting (treated soil must remain bare for several weeks), and is not always as reliable as we hope. Many homeowners and professionals who work in landscape maintenance prefer to use pesticides not at all, or only in the most dire circumstances. Hence, new products that claim to control nematodes without pesticides are attractive. How worthwhile are some products being offered in Florida this spring as nematicides or as promoters of natural biological control of nematodes?

ClandoSan® has, by heavily advertising in trade magazines and a successful public relations campaign via newspaper articles, become noticed throughout the eastern U.S. It is self-described as a "natural chitin-protein nematicide" that provides "safe", effective and sustained *biological* control of plant-pathogenic nematodes." There is some question as to whether it is properly registered with the Florida Department of Agriculture and Consumer Services as either a pesticide ("nematicide" in its claims) or a fertilizer/soil amendment. There appears to be no research with this product in Florida, or in comparable soils and nematode pressure. However, formulation of the product is based on legitimate research with soil amendment materials conducted at Auburn, Alabama.

Auburn University scientists studied effects on root-knot nematodes of several rates of soybean meal, shrimp processing wastes (a chitin-containing material), and urea. Each by itself gave some increased growth and/or root-knot nematode suppression in preliminary tests in potted soil in a greenhouse. An "optimum" proportion of those three components was determined by further greenhouse testing. That optimum mixture of materials was then tested as a soil amendment in small field plots infested with the "peanut" root-knot nematode, with eggplant and southern peas as the test crops. Use of the mixture of soil amendment materials provided yields about 70% greater than unamended soil and equal to those provided by treatment with a very high rate of the commercial nematicide aldicarb (the combining of soil amendments with the pesticide increased yields about 130%). ClandoSan is supposed to be made up of the same components, in different proportions for different soils.

The mechanism(s) by which the soil amendments benefited the test crops were not determined: there are certainly fertilizer materials in the treatment, there may be some slight liming effect from the chitinous component, and the soybean meal and chitinous material are felt to promote the growth of fungi and other microorganisms that are natural enemies of plant nematodes. Further testing is needed to be sure that the responses are consistently obtained, and to try to sort out the mechanism(s) of the effect.

Therefore, we have no direct experience with ClandoSan on the range of soils, nematodes, and plant materials for which it might be used in Florida. However, promising results with its components in Alabama encourage us to suggest that Floridians try it cautiously under conditions in which they can tell objectively if the treatment truly reduces nematode damage to crops and improves plant quality or yield. By no means should anyone depend heavily on the product for nematode control until more is known about it.

Bioenergy Plus® is another product being promoted here that claims to reduce nematode damage to plants. Promotional literature identifies it as a complex and secret mixture of ingredients that have included sugar cane filter press cake, bird guano, agricultural gypsum, selected seaweeds, peanut hulls, wood ash, rice hull ash, bagasse ash, toasted bone meal, queensand, dried blood meal, cement kiln flue ash, sawdust, tobacco stems, hoof and horn meal, brewery waste, calcium carbonate, basalt dust, pumice stone powder, coffee and cocoa hull residues, chicken feathers, bamboo leaves, charcoal, goat and sheep manure, "...ferment, dried, matured, micropulverized and well mixed in proportions as required for the different soils and cultivars."

Elaborate claims by Bioenergy Plus for control of nematodes and pathogenic fungi are not supported by any sort of data in their own literature, although plenty of testimonials are presented. It is touted in lavishly-worded "scientific-sounding" language fraught with errors, misinformation, and invented words that sound technical but mean nothing. In one case for which tremendous yield responses are claimed, the product is said to have been applied at the rate of 600 cwt (30 *tons*) per acre. In our organic-matter poor soils, incorporation of that much organic material is likely to be very beneficial to plant growth, through many mechanisms, however, there is no reason to believe that use of locally-available organic soil amendments would not be equally helpful at much less cost.

Reputable products that truly provide the benefits for which they are sold do not need to claim "magic" effects nor to rely solely on testimonials to establish their worth. Claims of harnessing "cosmic rays." "mesons," or releasing special electrons appeal to ignorance, but have no relationship to the factors that are needed for healthy plant growth. Beware of products that rely heavily on testimonials to establish their worth; anyone who has good, objective data upon which to base their arguments will use them. That is the basis of science. Scientists are trained to be skeptical, to measure carefully the effect of each new idea, practice, or product. Their conclusions about the matter under test must be based as much as possible on careful analysis of the objective measurements of the effects of the treatments (data). Publication of those data in recognized scientific journals is evidence that other scientists who are in no way connected with the work have reviewed it carefully and judged that the research was done well and the results interpreted fairly. If any of these soil treatments can truly claim to be nematicides or to promote nematode suppression, their promoters should have data from well-designed experiments, published in appropriate established scientific journals, to substantiate those claims. Otherwise, they are selling hope and wishful thinking that may have no basis in fact.

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